IB820

Full-Size Socket 478 Pentium 4
Intel 845G CPU Card

USER'S MANUAL

Version 1.0B

Acknowledgments

Award is a registered trademark of Award Software International, Inc.
PS/2 is a trademark of International Business Machines Corporation.
Intel and Pentium 4 are registered trademarks of Intel Corporation.
Microsoft Windows is a registered trademark of Microsoft Corporation.
Winbond is a registered trademark of Winbond Electronics Corporation.
All other product names or trademarks are properties of their respective owners.

Table of Contents

Introduction.....1

Product Description 1
Checklist.....2
Specifications.....3
Board Dimensions.....4

Installations 5

Installing the CPU.....6
ATX Power Installation 7
MicroPCI Daughter Card Installation 7
Installing the Memory.....8
Setting the Jumpers.....9
Connectors on IB820 14
Watchdog Timer 26

BIOS Setup.....31

Drivers Installation.....53

Appendix 69

A. I/O Port Address Map 69
B. Interrupt Request Lines (IRQ) 70

This page is intentionally left blank.

Introduction

Product Description

The IB820 Pentium 4 Full Size PICMG CPU Card incorporates the Intel® advanced 845G Chipset Memory Controller hub and supports 478-pin Intel Pentium 4 processors of 1.3GHz and up to 3.06GHz+ with FSB 533MHz/400MHz. IB820 supports the Pentium 4 processor with 256-KB L2 cache and the Pentium 4 processor with 512-KB L2 cache on 0.13 micron process.

The I/O functions are on IB820 integrated onto the ICH4. It supports either the integrated graphics device (IGD) on the GMCH or an external graphics device on AGP. The IGD has 3D, 2D, and video capabilities. The system memory size can be up to 2 GB, using the two DDR sockets on board. Six USB ports are supported with the USB 1.1/2.0 standard.

IB820 optionally supports the ATI Mobility M7 graphics controller with 16MB or 32MB embedded memory. Interface supported are LVDS, TMDS and dual CRT. The VGA functionality offers unprecedented video quality and ***integrated MPEG-2 decode capability***. IB820 also optionally comes with an Intel 82540 Gigabit LAN controller for faster networking access.

IB820 supports a MicroPCI socket for MicroPCI daughter cards with VGA, VGA/LAN, Ethernet (LAN), SCSI, and IEEE 1394 functions.

This CPU card represents the perfect choice for those who want superior performance for rugged and demanding applications in industrial automation, image processing, multimedia and telecommunications.

Checklist

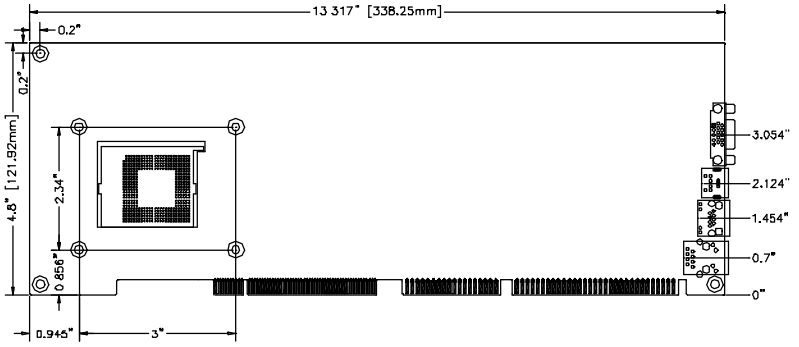
Your IB820 package should include the items listed below.

- The IB820 Industrial CPU Card
- This User' s Manual
- 1 IDE Ribbon Cable
- 1 Floppy Ribbon Connector
- 2 Serial Port Ribbon Cable and 1 Parallel Port Attached to a Mounting Bracket
- 1 Y-Cable supporting a PS/2 Keyboard and a PS/2 Mouse
- 1 CD containing the following:
  - Chipset Drivers
  - Flash Memory Utility
- Optional audio cable with bracket (Audio8K)
- Optional USB cable with bracket (USB2K-4)
- Optional Secondary CRT VGA cable with bracket (VGA4K)
- Optional TMDS/CRT cable with bracket (ID120P)

Specifications

CPU Socket	Socket 478
CPU	Intel Pentium 4, 1.30GHz ~ 2.6GHz+
CPU Front Side Bus	533MHz / 400MHz
Chipset	Intel 845G Chipset
L2 Cache	128K/256K/512K, CPU integrated
BIOS	Award BIOS, ACPI supported
System Memory	Two DDR sockets, up to 2GB DDR SDRAM
Integrated VGA	Intel 845G integrated VGA Supports CRT interface
Optional VGA	ATI Mobility M7 graphics controller 16MB/32MB embedded memory Frame buffer (DDR, AGP4X) LVDS/TMDS/dual CRT interface
LAN	ICH4 integrated Ethernet controller 10Base-T / 100Base-TX Protocol Optional Gigabit Ethernet solution
Audio	ICH4 integrated audio Optional AC97 codec and audio cable
LPC I/O	W83627HF chipset supports IrDA x 1, Parallel x 1, COM1 (RS232), COM2 (RS232/422/485), FDC up to 2.88MB (3Mode support) Hardware Monitor (3 thermal inputs, 6 voltage monitor inputs, VID0-4, 3 fan headers)
IDE Interface	Built in ICH4; Two enhanced IDE supports 4 IDE devices including UDMA33/66/100, PIO mode 4 and bus master
FDD Interface	Supports up to two floppy disk drives: 3.5" and/or 5.25" drives; 3 Mode support
Parallel Port	One parallel port supports SPP/EPP/ECP
Serial Ports	One RS-232/422/485 and one RS-232 port
Watchdog Timer	Generates system reset; 256 levels
SSD Interface	Supports 2MB~144MB M-Systems DiskOnChip flash disk
Hardware Monitoring	Built in W83627HF; monitors system/CPU temperature and voltage status
USB	Supports 6 USB ports, USB 1.1/2.0 compliant
IrDA	Pin header
Keyboard and Mouse	PS/2 type connectors
Extra Features	ISA High Drive, PCI to ISA Bridge (ITE 8888) One MicroPCI socket, ATX 12V power connector
Power Consumption	Pentium 4 1.8GHz with 512MB DDR SDRAM +5V: 5.7A +12V: 8.5A Pentium 4 2.2GHz with 512MB DDR SDRAM +5V: 6.4A +12V: 6.3A
Form Factor	Full Size CPU Card
Dimensions	338mm x 122mm (13.3” x 4.8”)

Board Dimensions



Installations

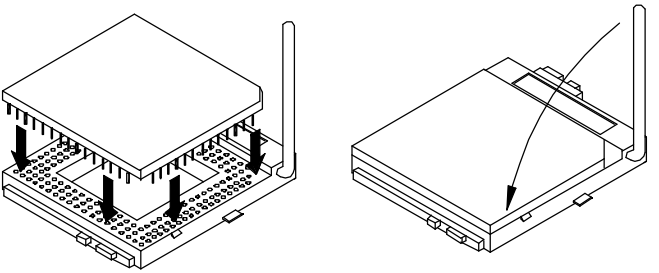
This section provides information on how to use the jumpers and connectors on the IB820 in order to set up a workable system. The topics covered are:

Installing the CPU.....6
ATX Power Installation.....7
MicroPCI Daughter Card Installation.....7
Installing the Memory.....8
Setting the Jumpers.....9
Connectors on IB820.....14
Watchdog Timer.....26

Installing the CPU

The IB820 CPU Card supports a Socket 478 processor socket for Intel Pentium 4 processors.

The Socket 478 processor socket comes with a lever to secure the processor. Raise this lever to about a 90° angle to allow the insertion of the processor. Place the processor into the socket by making sure the notch on the corner of the CPU corresponds with the notch on the inside of the socket. Once the processor has slide into the socket, return the lever to the lock position. Refer to the figures below.



After you have installed the processor into the socket, check if the jumpers for the CPU type and speed are correct.

***NOTE**: Ensure that the CPU heat sink and the CPU top surface are in total contact to avoid CPU overheating problem that would cause your system to hang or be unstable.*

ATX Power Installation

The system power is provided to the IB820 CPU card with the J1 and J8 ATX power connectors. Please note that the J8 external ATX power connector should be connected to the backplane for IB820 to function. J8 is a 3-pin power connector. J1 is a 4-pin 12V power connector. J1 is to be connected to the ATX power supply.

MicroPCI Daughter Card Installation

To insert the MicroPCI daughter cards, position it at 30° to the PCB and gently push it into the MicroPCI connector (See Figure 1 below). The card will not fit when inserted at an angle of 45° or 15°. Once inserted, slowly press the card towards the PCB until it locks on both sides to the clips of the connector. Screw the card to the PCB to secure the installation. To remove the MicroPCI card, pull the ‘ clips’ sideways as shown in Figure 2 below.

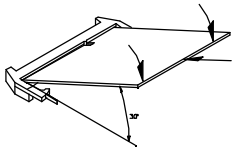


Figure 1.

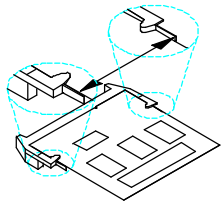


Figure 2.

Installing the Memory

The IB820 CPU Card supports two DDR memory sockets for a maximum total memory of 2GB in DDR memory type. The memory module capacities supported are 64MB, 128MB, 256MB, 512MB and 1GB. The following table lists the supported SDR DIMM configurations. Intel 845G supports configurations defined in the JEDEC DDR DIMM specification only (A,B,C). Non-JEDEC standard DIMMs such as double-sided x16 DDR SDRAM DIMMs are not supported.

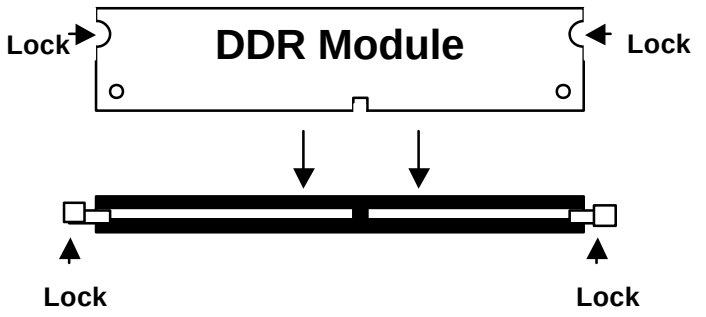
Supported DDRM DIMM Configurations.

Density	64 Mbit		128Mbit		256Mbit		512Mbit	
Device Width	X8	X16	X8	X16	X8	X16	X8	X16
Single/ Double	SS/DS	SS/DS	SS/DS	SS/DS	SS/DS	SS/DS	SS/DS	SS/DS
184-pin DDR	64/128MB	32MB/NA	128/256MB	64MB/NA	256/512MB	128MB/NA	512/1024M	256MB/NA

Installing and Removing Memory Modules

To install the DDR modules, locate the memory slot on the CPU card and perform the following steps:

1. Hold the DDR module so that the key of the DDR module align with those on the memory slot.
2. Gently push the DDR module in an upright position until the clips of the slot close to hold the DDR module in place when the DDR module touches the bottom of the slot.
3. To remove the DDR module, press the clips with both hands.

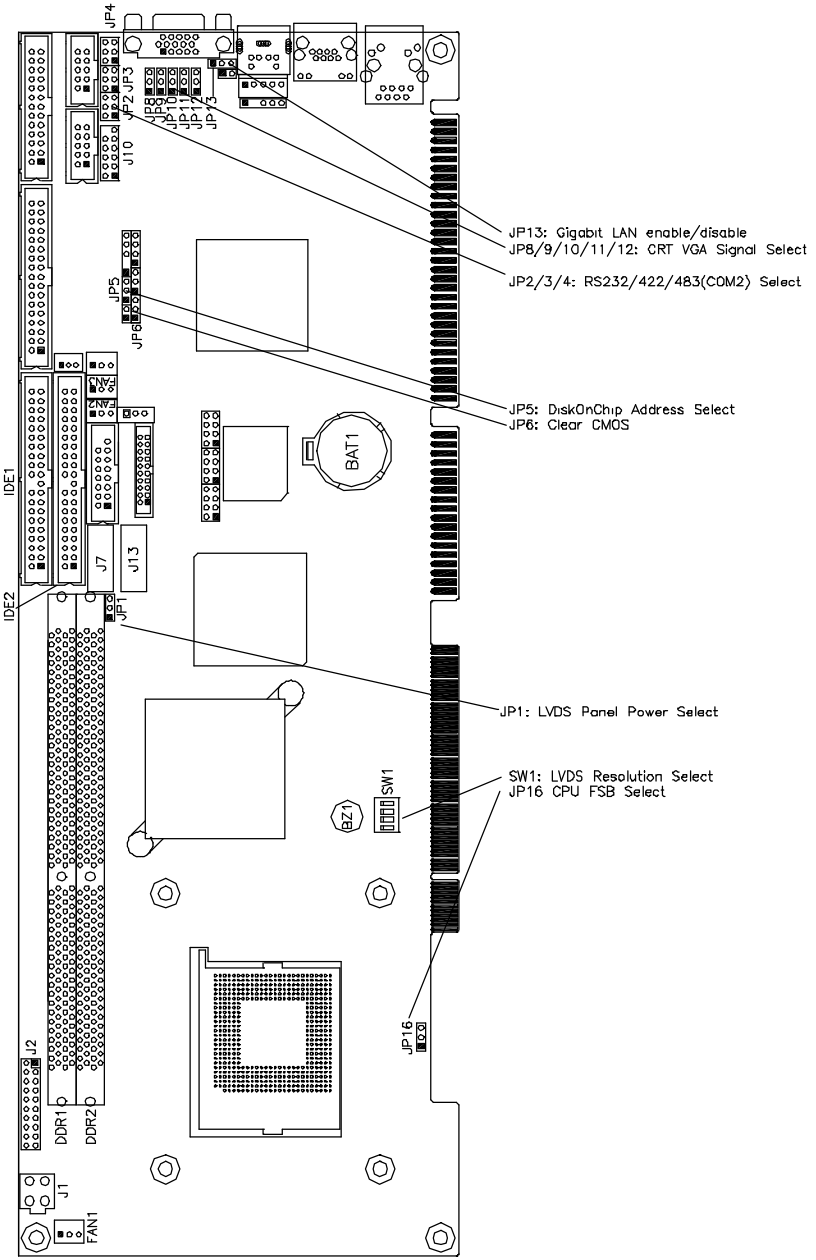


Setting the Jumpers

Jumpers are used on IB820 to select various settings and features according to your needs and applications. Contact your supplier if you have doubts about the best configuration for your needs. The following lists the connectors on IB820 and their respective functions.

Jumper Locations on IB820 10
Configuring the CPU Frequency 11
JP16: CPU Front Side Bus Select 11
JP2, JP3, JP4: RS232/422/485 (COM2) Selection 11
JP5: DiskOnChip Address Select 11
JP6: Clear CMOS Contents 12
JP8, JP9, JP10, JP11, JP12: CRT VGA Signal Select 12
JP13: Gigabit LAN Enable/Disable 12
SW1: LVDS Resolution Select 13
LVDS Panel Power Select 13

Jumper Locations on IB820



Configuring the CPU Frequency

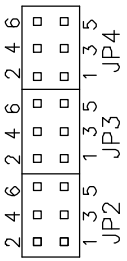
The IB820 CPU card does not provide DIP switches to configure the processor speed (CPU frequency). However, JP16 can be used to select the Front Side Bus of the processor.

JP16: CPU Front Side Bus Select

JP16	Front Side Bus
	Auto (Default)
	100Mhz
	133Mhz

JP2, JP3, JP4: RS232/422/485 (COM2) Selection

COM1 is fixed for RS-232 use only.
COM2 is selectable for RS232, RS-422 and RS-485.
The following table describes the jumper settings for COM2 selection.



COM2 Function	RS-232	RS-422	RS-485
Jumper Setting (pin closed)	JP2: 1-2 JP3: 3-5 & 4-6 JP4: 3-5 & 4-6	JP2: 3-4 JP3: 1-3 & 2-4 JP4: 1-3 & 2-4	JP2: 5-6 JP3: 1-3 & 2-4 JP4: 1-3 & 2-4

JP5: DiskOnChip Address Select

JP5	Address
	D0000-D7FFF
	D8000-DFFFF (default)

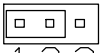
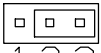
JP6: Clear CMOS Contents

Use JP6, a 3-pin header, to clear the CMOS contents. *Note that the ATX-power connector should be disconnected from the CPU card before clearing CMOS.*

JP6	Setting	Function
	Pin 1-2 Short/Closed	Normal
	Pin 2-3 Short/Closed	Clear CMOS

JP8, JP9, JP10, JP11, JP12: CRT VGA Signal Select

Use JP8, JP9, JP10, JP11, and JP12 to select the CRT VGA signal, either from the on board VGA or from an optional MicroPCI VGA.

JP8/9/10/11/12	Function
	On Board VGA
	MicroPCI VGA

JP13: Gigabit LAN Enable/Disable

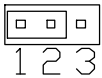
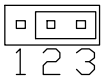
JP13	Function
	Enable Gigabit LAN
	Disable Gigabit LAN

* Note: Use this jumper only when your CPU card has the Gigabit LAN function.

SW1: LVDS Resolution Select

SW1-1	SW1-2	SW1-3	Resolution
OFF	ON	ON	800x600 18 bit
ON	OFF	ON	1024x768 18bit
OFF	OFF	ON	1024x768 24 bit

JP1: LVDS Panel Power Select

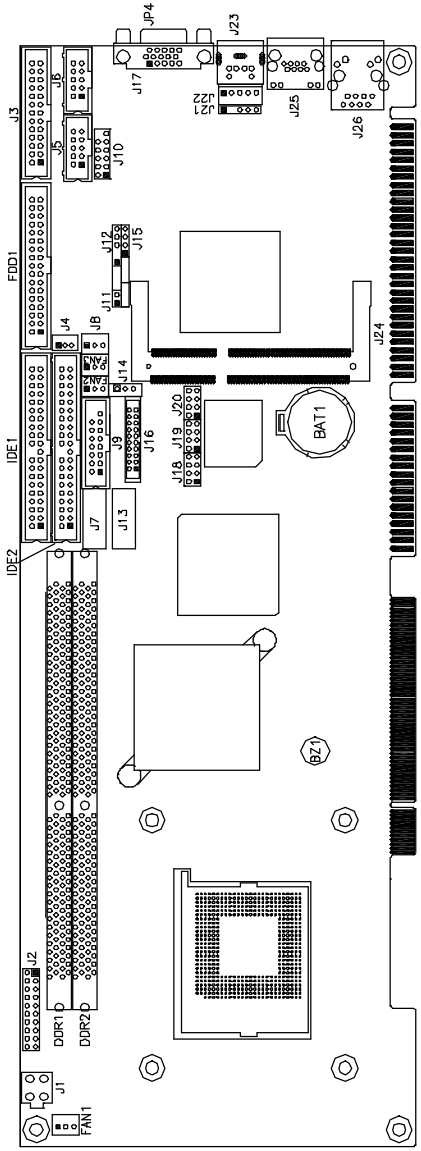
JP1	Power
	3.3V
	5V

Connectors on IB820

The connectors on IB820 allows you to connect external devices such as keyboard, floppy disk drives, hard disk drives, printers, etc. The following table lists the connectors on IB820 and their respective functions.

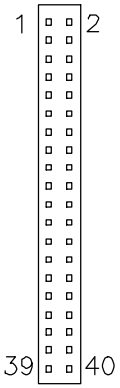
Connector Locations on IB820 15
IDE1, IDE2: EIDE Connectors 16
FDD1: Floppy Drive Connector 17
J1: ATX 12V/+12V Power Connector 17
FAN1: CPU Fan Power Connector 17
FAN2: System Fan Power Connector 18
FAN3: Auxiliary Fan Power Connector 18
J2: System Function Connector 18
J3: Parallel Port Connector 20
J5, J6: COM1 and COM2 Serial Ports Connector 21
J7, J13: LVDS Connectors (2nd channel, 1st channel) 21
J8: External ATX Power Connector 22
J9: CRT2 / TV-Out Connector 22
J10: External Audio Connector 22
J12: IrDA Connector 23
J14: Panel Inverter Power Connector 23
J15: CD-In Audio Connector 23
J16: TMDS Panel Connector 23
J17: VGA CRT Connector 24
J18, J19, J20: USB Connectors 24
J21, J22: External PS/2 Keyboard and Mouse Connector 25
J23: PS/2 Keyboard and Mouse Connector 25
J25: Gigabit LAN RJ45 Connector 25
J26: Primary RJ45 Connector 25

Connector Locations on IB820



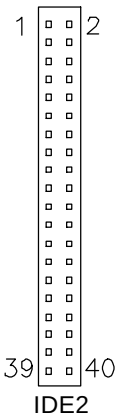
IDE1, IDE2: EIDE Connectors
FDD1: Floppy Drive Connector
J1: ATX 12V/+12V Power Connector
FAN1: CPU Fan Power Connector
FAN2: System Fan Power Connector
FAN3: Auxiliary Fan Power Connector
J2: System Function Connector
J3: Parallel Port Connector
J5, J6: COM1 and COM2 Serial Ports
J7, J13: LVDS Connectors
J8: External ATX Power Connector
J9: CRT2 / TV-Out Connector
J10: External Audio Connector
J12: IrDA Connector
J14: Panel Inverter Power Connector
J15: CD-In Audio Connector
J16: TMDS Panel Connector
J17: VGA CRT Connector
J18, J19, J20: USB Connectors
J21, J22: External PS/2 KB and Mouse
J23: PS/2 Keyboard and Mouse
J25: Gigabit LAN RJ45 Connector (option)
J26: Primary RJ45 Connector

IDE1, IDE2: EIDE Connectors



IDE1: Primary IDE Connector

Signal Name	Pin #	Pin #	Signal Name
Reset IDE	1	2	Ground
Host data 7	3	4	Host data 8
Host data 6	5	6	Host data 9
Host data 5	7	8	Host data 10
Host data 4	9	10	Host data 11
Host data 3	11	12	Host data 12
Host data 2	13	14	Host data 13
Host data 1	15	16	Host data 14
Host data 0	17	18	Host data 15
Ground	19	20	Protect pin
DRQ0	21	22	Ground
Host IOW	23	24	Ground
Host IOR	25	26	Ground
IOCHRDY	27	28	Host ALE
DACK0	29	30	Ground
IRQ14	31	32	No connect
Address 1	33	34	No connect
Address 0	35	36	Address 2
Chip select 0	37	38	Chip select 1
Activity	39	40	Ground



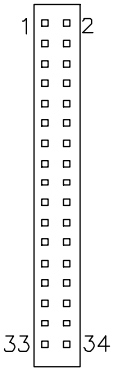
IDE2: Secondary IDE Connector

Signal Name	Pin #	Pin #	Signal Name
Reset IDE	1	2	Ground
Host data 7	3	4	Host data 8
Host data 6	5	6	Host data 9
Host data 5	7	8	Host data 10
Host data 4	9	10	Host data 11
Host data 3	11	12	Host data 12
Host data 2	13	14	Host data 13
Host data 1	15	16	Host data 14
Host data 0	17	18	Host data 15
Ground	19	20	Protect pin
DRQ1	21	22	Ground
Host IOW	23	24	Ground
Host IOR	25	26	Ground
IOCHRDY	27	28	Host ALE
DACK1	29	30	Ground
IRQ15	31	32	No connect
Address 1	33	34	No connect
Address 0	35	36	Address 2
Chip select 0	37	38	Chip select 1

Activity	39	40	Ground

FDD1: Floppy Drive Connector

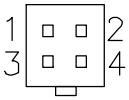
FDD1 is a 34-pin header and will support up to 2.88MB floppy drives.



FDD1

Signal Name	Pin #	Pin #	Signal Name
Ground	1	2	RM/LC
Ground	3	4	No connect
Ground	5	6	No connect
Ground	7	8	Index
Ground	9	10	Motor enable 0
Ground	11	12	Drive select 1
Ground	13	14	Drive select 0
Ground	15	16	Motor enable 1
Ground	17	18	Direction
Ground	19	20	Step
Ground	21	22	Write data
Ground	23	24	Write gate
Ground	25	26	Track 00
Ground	27	28	Write protect
Ground	29	30	Read data
Ground	31	32	Side 1 select
Ground	33	34	Diskette change

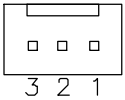
J1: ATX 12V/+12V Power Connector



Pin #	Signal Name
1	Ground
2	Ground
3	+12V
4	+12V

FAN1: CPU Fan Power Connector

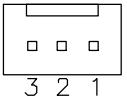
FAN1 is a 3-pin header for the CPU fan. The fan must be a 12V fan.



Pin #	Signal Name
1	Ground
2	+12V
3	Rotation detection

FAN2: System Fan Power Connector

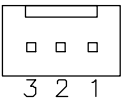
FAN2 is a 3-pin header for the system fan. The fan must be a 12V fan.



Pin #	Signal Name
1	Ground
2	+12V
3	Rotation detection

FAN3: Auxiliary Fan Power Connector

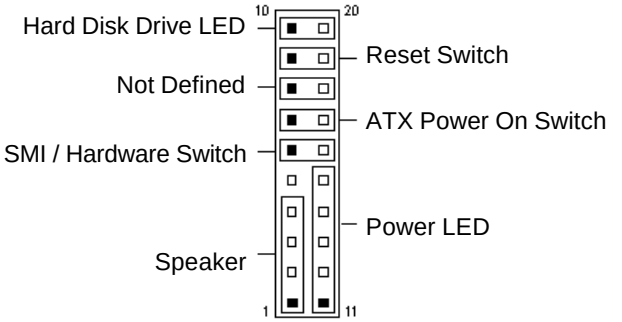
FAN3 is a 3-pin header for a 12V fan.



Pin #	Signal Name
1	Ground
2	+12V
3	Rotation detection

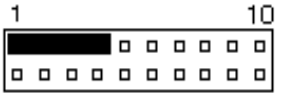
J2: System Function Connector

J2 provides connectors for system indicators that provide light indication of the computer activities and switches to change the computer status. J2 is a 20-pin header that provides interfaces for the following functions.



Speaker: Pins 1 - 4

This connector provides an interface to a speaker for audio tone generation. An 8-ohm speaker is recommended.

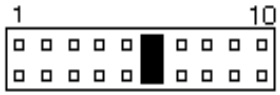


Pin #	Signal Name
1	Speaker out
2	No connect
3	Ground
4	+5V

Power LED: Pins 11 - 15
The power LED indicates the status of the main power switch.

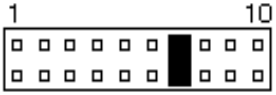
Pin #	Signal Name
11	Power LED
12	No connect
13	Ground
14	No connect
15	Ground

SMI/Hardware Switch: Pins 6 and 16
This connector supports the "Green Switch" on the control panel, which, when pressed, will force the system into the power-saving mode immediately.

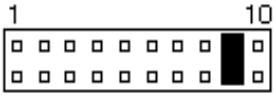


Pin #	Signal Name
6	SMI
16	Ground

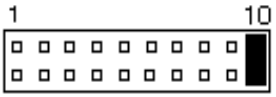
ATX Power ON Switch: Pins 7 and 17
This 2-pin connector is an “ATX Power Supply On/Off Switch” on the system that connects to the power switch on the case. When pressed, the power switch will force the system to power on. When pressed again, it will force the system to power off.



Reset Switch: Pins 9 and 19
The reset switch allows the user to reset the system without turning the main power switch off and then on again. Orientation is not required when making a connection to this header.



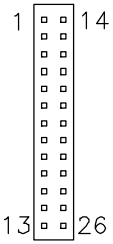
Hard Disk Drive LED Connector: Pins 10 and 20
This connector connects to the hard drive activity LED on control panel. This LED will flash when the HDD is being accessed.



Pin #	Signal Name
10	HDD Active
20	5V

J3: Parallel Port Connector

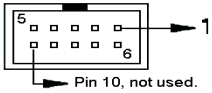
The following table describes the pin out assignments of this connector.



Signal Name	Pin #	Pin #	Signal Name
Line printer strobe	1	14	AutoFeed
PD0, parallel data 0	2	15	Error
PD1, parallel data 1	3	16	Initialize
PD2, parallel data 2	4	17	Select
PD3, parallel data 3	5	18	Ground
PD4, parallel data 4	6	19	Ground
PD5, parallel data 5	7	20	Ground
PD6, parallel data 6	8	21	Ground
PD7, parallel data 7	9	22	Ground
ACK, acknowledge	10	23	Ground
Busy	11	24	Ground
Paper empty	12	25	Ground
Select	13	N/A	N/A

J5, J6: COM1 and COM2 Serial Ports Connector

J5 and J6 both 10-pin headers, are the onboard serial port connectors.



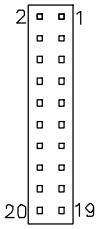
J5
Fixed as
RS-232

J6
Configurable
as RS-232/
RS-422/485
with jumpers
JP2/JP3/JP4

Pin #	Signal Name		
	RS-232	**RS-422**	**RS-485**
1	DCD	TX-	DATA-
2	RX	TX+	DATA+
3	TX	RX+	NC
4	DTR	RX-	NC
5	GND	GND	GND
6	DSR	RTS-	NC
7	RTS	RTS+	NC
8	CTS	CTS+	NC
9	RI	CTS-	NC
10	NC	NC	NC

J7, J13: LVDS Connectors (2nd channel, 1st channel)

The LVDS connectors are composed of the first channel (J13) and second channel (J7) to support 24-bit or 48-bit.



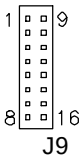
Signal Name	Pin #	Pin #	**Signal Name**
TX0-	2	1	TX0+
Ground	4	3	Ground
TX1-	6	5	TX1+
5V/3.3V	8	7	Ground
TX3-	10	9	TX3+
TX2-	12	11	TX2+
Ground	14	13	Ground
TXC-	16	15	TXC+
5V/3.3V	18	17	ENABKL
+12V	20	19	+12V

J8: External ATX Power Connector

Pin #	Signal Name
1	Ground
2	PS-ON (soft on/off)
3	5VSB (Standby +5V)

J9: CRT2 / TV-Out Connector

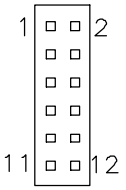
This connector allows you to connect to a second CRT monitor or use with a TV output device.



Signal Name	Pin #	Pin #	Signal Name
Red / C	1	9	+5V
Green / Y	2	10	Ground
Blue / COMP	3	11	N. C.
N.C.	4	12	CRT2 DDCDAT
Ground	5	13	HSYNC
Ground	6	14	VSYNC
Ground	7	15	CRT2 DDCCLK
Ground	8	16	N.C.

J10: External Audio Connector

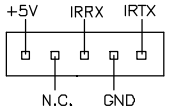
J10 is a 12-pin header that is used to connect to the optional audio cable that integrates jacks for Line In, Line Out and Mic.



Signal Name	Pin #	Pin #	Signal Name
LINEOUT_R	1	2	LINEOUT_L
Ground	3	4	Ground
LINEIN_R	5	6	LINEIN L
Ground	7	8	Ground
Mic-In	9	10	VREFOUT
Ground	11	12	Protect pin

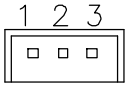
J12: IrDA Connector

J12 is used for an optional IrDA connector for wireless communication.



Pin #	Signal Name
1	+5V
2	No connect
3	Ir RX
4	Ground
5	Ir TX

J14: Panel Inverter Power Connector



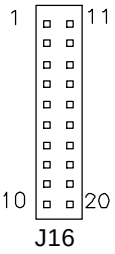
Pin #	Signal Name
1	+12V
2	NC
3	Ground

J15: CD-In Audio Connector

Pin #	Signal Name
1	CD Audio R
2	Ground
3	Ground
4	CD Audio L

J16: TMDS Panel Connector

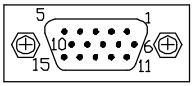
TMDS stands Transition Minimized Differential Signaling. J16 TMDS panel connector is to be connected to an optional TMDS daughter card.



Signal Name	Pin #	Pin #	Signal Name
TX1P	1	11	TX2P
TXIN	2	12	TX2N
GND	3	13	GND
GND	4	14	GND
TXCP	5	15	TX0P
TXCN	6	16	TX0N
GND	7	17	NC
+5v	8	18	NC
HTPG	9	19	DDCDATA
NC	10	20	DDCCLK

J17: VGA CRT Connector

The pin assignments of the J17 VGA CRT connector are as follows:

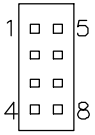


J26

Signal Name	Pin	Pin	Signal Name
Red	1	2	Green
Blue	3	4	N.C.
GND	5	6	GND
GND	7	8	GND
N.C.	9	10	GND
N.C.	11	12	N.C.
HSYNC	13	14	VSYNC
NC	15		

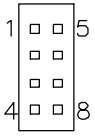
J18, J19, J20: USB Connectors

The following table shows the pin outs of the USB pin headers connectors. Overall, the three pin headers support six USB ports.



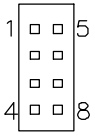
J18

Signal Name	Pin	Pin	Signal Name
Vcc	1	5	Ground
USB0-	2	6	USB1+
USB0+	3	7	USB1-
Ground	4	8	Vcc



J19

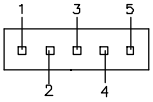
Signal Name	Pin	Pin	Signal Name
Vcc	1	5	Ground
USB2-	2	6	USB3+
USB2+	3	7	USB3-
Ground	4	8	Vcc



J20

Signal Name	Pin	Pin	Signal Name
Vcc	1	5	Ground
USB4-	2	6	USB5+
USB4+	3	7	USB5-
Ground	4	8	Vcc

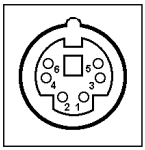
J21, J22: External PS/2 Keyboard and Mouse Connector



Pin #	J21	J22
1	Mouse data	KB clock
2	N.C.	KB data
3	Ground	N.C.
4	Vcc	Ground
5	Mouse clock	Vcc

J23: PS/2 Keyboard and Mouse Connector

J23 uses a Y-cable with dual D-connectors for a PS/2 keyboard and a PS/2 mouse.

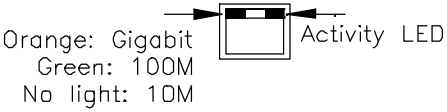


J23

Pin #	Signal Name
1	Mouse data
2	Keyboard data
3	Ground
4	Vcc
5	Mouse Clock
6	Keyboard Clock

J25: Gigabit LAN RJ45 Connector

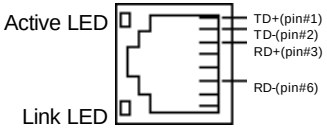
J25 is the Gigabit LAN RJ45 connector.



* Note: This connector is only present when your CPU card has the Gigabit LAN function.

J26: Primary RJ45 Connector

J26 is the primary RJ-45 connector based on the chipset integrated LAN. The figure below shows the pin out assignments of the connector and its corresponding input jack.



RJ-45

Watchdog Timer Configuration

The WDT is used to generate a variety of output signals after a user programmable count. The WDT is suitable for use in the prevention of system lock-up, such as when software becomes trapped in a deadlock. Under these sort of circumstances, the timer will count to zero and the selected outputs will be driven. Under normal circumstance, the user will restart the WDT at regular intervals before the timer counts to zero.

SAMPLE CODE:
This code and information is provided "as is" without warranty of any kind, either expressed or implied, including but not limited to the implied warranties of merchantability and/or fitness for a particular purpose.

```
;[]============================================
; Name  : Enable_And_Set_Watchdog
; IN    : AL - 1sec ~ 255sec
; OUT   : None
;[]============================================
Enable_And_Set_Watchdog   Proc    Near
        push    ax              ;save time interval
        call Unlock_Chip

        mov     cl, 2Bh
        call Read_Reg
        and al, NOT 10h
        call Write_Reg          ;set GP24 as WDTO

        mov     cl, 07h
        mov     al, 08h
        call Write_Reg          ;switch to LD8
```

```
        mov     cl, 0F5h
        call Read_Reg
        and al, NOT 08h
        call Write_Reg      ;set count mode as second

        pop ax
        mov     cl, 0F6h
        call Write_Reg      ;set watchdog timer

        mov     al, 01h
        mov     cl, 30h
        call Write_Reg      ;watchdog enabled

        call Lock_Chip
        ret
Enable_And_Set_Watchdog  Endp
;[]=============================================
; Name  : Disable_Watchdog
; IN    : None
; OUT   : None
;[]=============================================
Disable_Watchdog  Proc    Near
        call Unlock_Chip

        mov     cl, 07h
        mov     al, 08h
        call Write_Reg      ;switch to LD8

        xor  al, al
        mov     cl, 0F6h
        call Write_Reg      ;clear watchdog timer

        xor  al, al
        mov     cl, 30h
        call Write_Reg      ;watchdog disabled

        call Lock_Chip
        ret
Disable_Watchdog  Endp
;[]=============================================
```

```
; Name   : Unlock_Chip
; IN : None
; OUT    : None
;[]=============================================
Unlock_Chip      Proc      Near
          mov      dx, 2Eh
          mov      al, 87h
          out  dx, al
          out  dx, al
          ret
Unlock_Chip      Endp
;[]=============================================
; Name   : Lock_Chip
; IN : None
; OUT    : None
;[]=============================================
Unlock_Chip      Proc      Near
          mov      dx, 2Eh
          mov      al, 0AAh
          out  dx, al
          ret
Unlock_Chip      Endp
;[]=============================================
; Name   : Write_Reg
; IN : CL - register index
;       AL - Value to write
; OUT    : None
;[]=============================================
Write_Reg    Proc      Near
          push      ax
          mov      dx, 2Eh
          mov      al,cl
          out  dx,al
          pop ax
          inc  dx
          out  dx,al
          ret
Write_Reg    Endp
;[]=============================================
```

```
; Name   : Read_Reg
; IN : CL - register index
; OUT    : AL - Value to read
;[]=============================================
===
Read_Reg    Proc      Near
            mov       al, cl
            mov       dx, 2Eh
            out  dx, al
            inc  dx
            in    al, dx
            ret
Read_Reg    Endp
;[]=============================================
```

This page was intentionally left blank.

BIOS Setup

This chapter describes the different settings available in the Award BIOS that comes with the CPU card. The topics covered in this chapter are as follows:

BIOS Introduction 32
BIOS Setup 32
Standard CMOS Setup 34
Advanced BIOS Features 37
Advanced Chipset Features 40
Integrated Peripherals 43
Power Management Setup 46
PNP/PCI Configurations 49
PC Health Status 50
Frequency/Voltage Control 51
Load Fail-Safe Defaults 52
Load Setup Defaults 52
Set Supervisor/User Password 52
Save & Exit Setup 52
Exit Without Saving 52

BIOS Introduction

The Award BIOS (Basic Input/Output System) installed in your computer system's ROM supports Intel Pentium 4 processors. The BIOS provides critical low-level support for a standard device such as disk drives, serial ports and parallel ports. It also adds virus and password protection as well as special support for detailed fine-tuning of the chipset controlling the entire system.

BIOS Setup

The Award BIOS provides a Setup utility program for specifying the system configurations and settings. The BIOS ROM of the system stores the Setup utility. When you turn on the computer, the Award BIOS is immediately activated. Pressing the <Del> key immediately allows you to enter the Setup utility. If you are a little bit late pressing the <Del> key, POST (Power On Self Test) will continue with its test routines, thus preventing you from invoking the Setup. If you still wish to enter Setup, restart the system by pressing the "Reset" button or simultaneously pressing the <Ctrl>, <Alt> and <Delete> keys. You can also restart by turning the system Off and back On again. The following message will appear on the screen:

```
Press  <DEL>  to  Enter  Setup
```

In general, you press the arrow keys to highlight items, <Enter> to select, the <PgUp> and <PgDn> keys to change entries, <F1> for help and <Esc> to quit.

When you enter the Setup utility, the Main Menu screen will appear on the screen. The Main Menu allows you to select from various setup functions and exit choices.

CMOS Setup Utility – Copyright ©1984-2001 Award Software

Standard CMOS Features	Frequency/Voltage Control
Advanced BIOS Features	Load Fail-Safe Defaults
Advanced Chipset Features	Load Optimized Defaults
Integrated Peripherals	Set Supervisor Password
Power Management Setup	Set User Password
PnP/PCI Configurations	Save & Exit Setup
PC Health Status	Exit Without Saving
ESC : Quit	↑ ↓ → ← : Select Item
F10 : Save & Exit Setup	
Time, Date, Hard Disk Type…	

The section below the setup items of the Main Menu displays the control keys for this menu. At the bottom of the Main Menu just below the control keys section, there is another section, which displays information on the currently highlighted item in the list.

***Note**: If the system cannot boot after making and saving system changes with Setup, the Award BIOS supports an override to the CMOS settings that resets your system to its default.*

***Warning:** It is strongly recommended that you avoid making any changes to the chipset defaults. These defaults have been carefully chosen by both Award and your system manufacturer to provide the absolute maximum performance and reliability. Changing the defaults could cause the system to become unstable and crash in some cases.*

Standard CMOS Setup

"Standard CMOS Setup" choice allows you to record some basic hardware configurations in your computer system and set the system clock and error handling. If the CPU card is already installed in a working system, you will not need to select this option. You will need to run the Standard CMOS option, however, if you change your system hardware configurations, the onboard battery fails, or the configuration stored in the CMOS memory was lost or damaged.

CMOS Setup Utility – Copyright ©1984-2001 Award Software
Standard CMOS Features

Date (mm:dd:yy)	Tue, Mar 26 2001	Item Help
Time (hh:mm:ss)	00 : 00 : 00	Menu Level
IDE Primary Master	Press Enter 13020 MB	Change the day, month,
IDE Primary Slave	Press Enter None	Year and century
IDE Secondary Master	Press Enter None	
IDE Secondary Slave	Press Enter None	
Drive A	1.44M, 3.5 in.	
Drive B	None	
Video	EGA/VGA	
Halt On	All Errors	
Base Memory	640K	
Extended Memory	129024K	
Total Memory	130048K	

At the bottom of the menu are the control keys for use on this menu. If you need any help in each item field, you can press the <F1> key. It will display the relevant information to help you. The memory display at the lower right-hand side of the menu is read-only. It will adjust automatically according to the memory changed. The following describes each item of this menu.

Date

The date format is:

Day : **Sun to Sat**
Month : **1 to 12**
Date : **1 to 31**
Year : **1994 to 2079**

To set the date, highlight the "Date" field and use the PageUp/ PageDown or +/- keys to set the current time.

Time

The time format is: **Hour : 00 to 23**
Minute : 00 to 59
Second : 00 to 59

To set the time, highlight the "Time" field and use the <PgUp>/ <PgDn> or +/- keys to set the current time.

IDE Primary HDDs / IDE Secondary HDDs

The onboard PCI IDE connectors provide Primary and Secondary channels for connecting up to four IDE hard disks or other IDE devices. Each channel can support up to two hard disks; the first is the "Master" and the second is the "Slave".

Press <Enter> to configure the hard disk. The selections include Auto, Manual, and None. Select 'Manual' to define the drive information manually. You will be asked to enter the following items.

CYLS :	Number of cylinders
HEAD :	Number of read/write heads
PRECOMP :	Write precompensation
LANDZ :	Landing zone
SECTOR :	Number of sectors

The Access Mode selections are as follows:

Auto	
Normal	(HD < 528MB)
Large	(for MS-DOS only)
LBA	(HD > 528MB and supports Logical Block Addressing)

Drive A / Drive B

These fields identify the types of floppy disk drive A or drive B that has been installed in the computer. The available specifications are:

360KB	1.2MB	720KB	1.44MB	2.88MB
5.25 in.	5.25 in.	3.5 in.	3.5 in.	3.5 in.

Video

This field selects the type of video display card installed in your system. You can choose the following video display cards:

EGA/VGA	For EGA, VGA, SEGA, SVGA or PGA monitor adapters. (default)
CGA 40	Power up in 40 column mode.
CGA 80	Power up in 80 column mode.
MONO	For Hercules or MDA adapters.

Halt On

This field determines whether or not the system will halt if an error is detected during power up.

No errors	The system boot will not be halted for any error that may be detected.
All errors	Whenever the BIOS detects a non-fatal error, the system will stop and you will be prompted.
All, But Keyboard	The system boot will not be halted for a keyboard error; it will stop for all other errors
All, But Diskette	The system boot will not be halted for a disk error; it will stop for all other errors.
All, But Disk/Key	The system boot will not be halted for a keyboard or disk error; it will stop for all others.

Advanced BIOS Features

This section allows you to configure and improve your system and allows you to set up some system features according to your preference.

CMOS Setup Utility – Copyright ©1984-2001 Award Software
Advanced BIOS Features

Virus Warning	**Disabled**	ITEM HELP
CPU L1 and L2 Cache	Enabled	Menu Level
Quick Power On Self Test	Enabled	
First Boot Device	Floppy	Allows you choose the VIRUS warning feature for IDE Hard Disk boot sector protection. If this function is enabled and someone attempt to write data into this area, BIOS will show a warning message on screen and alarm beep
Second Boot Device	HDD-0	
Third Boot Device	CD-ROM	
Boot Other Device	Enabled	
Swap Floppy Drive	Disabled	
Boot Up Floppy Seek	Enabled	
Boot Up Numlock Status	On	
Gate A20 Option	Fast	
Typematic Rate Setting	Disabled	
Typematic Rate (chars/Sec)	6	
Typematic Delay (Msec)	250	
Security Option	Setup	
APIC Mode	Enabled	
MPS Version Control for OS	1.4	
OS Select For DRAM>64MB	Non-OS2	
Report No FDD For WIN 95	Yes	
Small Logo (EPA) Show	Disabled	

Virus Warning

This item protects the boot sector and partition table of your hard disk against accidental modifications. If an attempt is made, the BIOS will halt the system and display a warning message. If this occurs, you can either allow the operation to continue or run an anti-virus program to locate and remove the problem.

CPU L1 and L2 Cache

Cache memory is additional memory that is much faster than conventional DRAM (system memory). CPUs from 486-type on up contain internal cache memory, and most, but not all, modern PCs have additional (external) cache memory. When the CPU requests data, the system transfers the requested data from the main DRAM into cache memory, for even faster access by the CPU. These items allow you to enable (speed up memory access) or disable the cache function. By default, these items are ***Enabled***.

Quick Power On Self Test

When enabled, this field speeds up the Power On Self Test (POST) after the system is turned on. If it is set to *Enabled*, BIOS will skip some items.

First/Second/Third Boot Device
These fields determine the drive that the system searches first for an operating system. The options available include *Floppy*, *LS/ZIP*, *HDD-0*, *SCSI*, *CDROM*, *HDD-1*, *HDD-2*, *HDD-3*, *LAN* and *Disable*.

Boot Other Device
These fields allow the system to search for an operating system from other devices other than the ones selected in the First/Second/Third Boot Device.

Swap Floppy Drive
This item allows you to determine whether or not to enable Swap Floppy Drive. When enabled, the BIOS swaps floppy drive assignments so that Drive A becomes Drive B, and Drive B becomes Drive A. By default, this field is set to ***Disabled.***

Boot Up Floppy Seek
This feature controls whether the BIOS checks for a floppy drive while booting up. If it cannot detect one (either due to improper configuration or its absence), it will flash an error message.

Boot Up NumLock Status
This allows you to activate the NumLock function after you power up the system.

Gate A20 Option
This field allows you to select how Gate A20 is worked. Gate A20 is a device used to address memory above 1 MB.

Typematic Rate Setting
When disabled, continually holding down a key on your keyboard will generate only one instance. When enabled, you can set the two typematic controls listed next. By default, this field is set to ***Disabled.***

Typematic Rate (Chars/Sec)
When the typematic rate is enabled, the system registers repeated keystrokes speeds. Settings are from 6 to 30 characters per second.

Typematic Delay (Msec)
When the typematic rate is enabled, this item allows you to set the time interval for displaying the first and second characters. By default, this item is set to ***250msec.***

Security Option

This field allows you to limit access to the System and Setup. The default value is ***Setup***. When you select *System,* the system prompts for the User Password every time you boot up. When you select *Setup,* the system always boots up and prompts for the Supervisor Password only when the Setup utility is called up.

APIC Mode

APIC stands for Advanced Programmable Interrupt Controller. The default setting is ***Enabled***.

MPS Version Control for OS

This option is specifies the MPS (Multiprocessor Specification) version for your operating system. MPS version 1.4 added extended configuration tables to improve support for multiple PCI bus configurations and improve future expandability. The default setting is ***1.4***.

OS Select for DRAM > 64MB

This option allows the system to access greater than 64MB of DRAM memory when used with OS/2 that depends on certain BIOS calls to access memory. The default setting is ***Non-OS/2***.

Report No FDD For WIN 95

If you are using Windows 95/98 without a floppy disk drive, select Enabled to release IRQ6. This is required to pass Windows 95/98's SCT test. You should also disable the Onboard FDC Controller in the Integrated Peripherals screen when there's no floppy drive in the system. If you set this feature to Disabled, the BIOS will not report the missing floppy drive to Win95/98.

Small Logo (EPA) Show

The EPA logo appears at the right side of the monitor screen when the system is boot up. The default setting is ***Disabled***.

Advanced Chipset Features

This Setup menu controls the configuration of the chipset.

CMOS Setup Utility – Copyright ©1984-2001 Award Software
Advanced Chipset Features

DRAM Timing Selectable	By SPD	ITEM HELP
CAS Latency Time	2.5	Menu Level
Active to Precharge Delay	6	
DRAM RAS# to CAS# Delay	3	
DRAM RAS# Precharge	3	
Turbo Mode	Disabled	
Memory Frequency For	Auto	
System BIOS Cacheable	Enabled	
Video BIOS Cacheable	Disabled	
Memory Hole At 15M-16M	Disabled	
Delayed Transaction	Enabled	
Delay Prior to Thermal	16 Min	
AGP Aperture Size (MB)	64	
ICH4 LAN	Enabled	
** On-Chip VGA Setting **		
On-Chip VGA	Enabled	
On-Chip Frame Buffer Size	8MB	
Boot Display	Auto	
FlashROM Write Protect	Disabled	

DRAM Timing Selectable

This option refers to the method by which the DRAM timing is selected. The default is ***By SPD***.

CAS Latency Time

You can select CAS latency time in HCLKs of 2/2 or 3/3. The system board designer should set the values in this field, depending on the DRAM installed. Do not change the values in this field unless you change specifications of the installed DRAM or the installed CPU. The choices are 2 and 3.

Active to Precharge Delay

The default setting for the Active to Precharge Delay is ***6***.

DRAM RAS# to CAS# Delay

This option allows you to insert a delay between the RAS (Row Address Strobe) and CAS (Column Address Strobe) signals. This delay occurs when the SDRAM is written to, read from or refreshed. Reducing the delay improves the performance of the SDRAM.

DRAM RAS# Precharge

This option sets the number of cycles required for the RAS to accumulate its charge before the SDRAM refreshes. The default setting for the Active to Precharge Delay is ***3***.

Memory Frequency For

This field sets the frequency of the DRAM memory installed. The default setting is ***Auto***. The other settings are *PC200* and *PC266*.

System BIOS Cacheable

The setting of *Enabled* allows caching of the system BIOS ROM at F000h-FFFFFh, resulting in better system performance. However, if any program writes to this memory area, a system error may result.

Video BIOS Cacheable

The Setting *Enabled* allows caching of the video BIOS ROM at C0000h-F7FFFh, resulting in better video performance. However, if any program writes to this memory area, a system error may result.

Memory Hole At 15M-16M

In order to improve performance, certain space in memory can be reserved for ISA cards. This memory must be mapped into the memory space below 16 MB. The choices are *Enabled* and *Disabled*.

Delayed Transaction

The chipset has an embedded 32-bit posted write buffer to support delay transactions cycles. Select *Enabled* to support compliance with PCI specification version 2.1.

Delay Prior to Thermal

This field activates the CPU thermal function after the systems boots for the set number of minutes. The options are ***16Min*** and ***64Min***.

AGP Aperture Size

The field sets aperture size of the graphics. The aperture is a portion of the PCI memory address range dedicated for graphics memory address space. Host cycles that hit the aperture range are forwarded to the AGP without any translation. The default setting is ***64M***.

FlashROM Write Protect
By default, the FlashROM Write Protect field is disabled. This field is related to the flashing of the BIOS ROM.

ICH4 LAN
By default, this field sets the ICH4 LAN function as ***Enabled***.

On-Chip VGA
By default, the On-Chip VGA or 845G chipset-integrated VGA is ***Enabled***.

On-Chip Frame Buffer Size
The On-Chip Frame Buffer Size can be set us 1MB or 8MB. This memory is shared with the system memory.

Boot Display
Boot Display determines the display output device where the system boots. The options are Auto, CRT, TV and EFP.

Integrated Peripherals

This section sets configurations for your hard disk and other integrated peripherals.

CMOS Setup Utility – Copyright ©1984-2001 Award Software
Integrated Peripherals

On-Chip Primary PCI IDE	Enabled	ITEM HELP
IDE Primary Master PIO	Auto	Menu Level
IDE Primary Slave PIO	Auto	
IDE Primary Master UDMA	Auto	
IDE Primary Slave UDMA	Auto	
On-Chip Secondary PCI IDE	Enabled	
IDE Secondary Master PIO	Auto	
IDE Secondary Slave PIO	Auto	
IDE Secondary Master UDMA	Auto	
IDE Secondary Slave UDMA	Auto	
USB 2.0 Controller	Disabled	
USB Controller	Enabled	
USB Keyboard Support	Disabled	
AC97 Audio	Auto	
Init Display First	PCI Slot	
IDE HDD Block Mode	Enabled	
Onboard FDC Controller	Enabled	
Onboard Serial Port 1	3F8/IRQ4	
Onboard Serial Port 2	2F8/IRQ3	
UART Mode Select	Normal	
Onboard Parallel Port	378/IRQ7	
Parallel Port Mode	SPP	
PWRON After PWR-Fail	Off	
Midi Port Address	Disabled	
Midi Port IRQ	10	

OnChip Primary/Secondary PCI IDE

The integrated peripheral controller contains an IDE interface with support for two IDE channels. Select *Enabled* to activate each channel separately.

IDE Primary/Secondary Master/Slave PIO

These fields allow your system hard disk controller to work faster. Rather than have the BIOS issue a series of commands that transfer to or from the disk drive, PIO (Programmed Input/Output) allows the BIOS to communicate with the controller and CPU directly.

The system supports five modes, numbered from 0 (default) to 4, which primarily differ in timing. When Auto is selected, the BIOS will select the best available mode.

IDE Primary/Secondary Master/Slave UDMA

These fields allow your system to improve disk I/O throughput to 33Mb/sec with the Ultra DMA/33 feature. The options are *Auto* and *Disabled*.

USB 2.0 Controller

The options for this field are *Enabled* and *Disabled*. By default, this field is set to ***Disabled***. In order to use USB 2.0, necessary OS drivers must be installed first.

USB Controller

The options for this field are *Enabled* and *Disabled*. By default, this field is set to ***Enabled***.

USB Keyboard Support

The options for this field are *Enabled* and *Disabled*. By default, this field is set to ***Disabled***.

AC97 Audio

The default setting of the AC97 Audio is ***Auto***.

Init Display First

This field allows the system to initialize first the VGA card on chip or the display on the PCI Slot. By default, the *PCI Slot* VGA is initialized first.

IDE HDD Block Mode

This field allows your hard disk controller to use the fast block mode to transfer data to and from your hard disk drive.

Onboard FDC Controller

Select *Enabled* if your system has a floppy disk controller (FDC) installed on the CPU card and you wish to use it. If you install an add-in FDC or the system has no floppy drive, select Disabled in this field. This option allows you to select the onboard FDD port.

Onboard Serial/Parallel Port

These fields allow you to select the onboard serial and parallel ports and their addresses. The default values for these ports are:

Serial Port 1	3F8/IRQ4
Serial Port 2	2F8/IRQ3
Parallel Port	378H/IRQ7

UART Mode Select

This field determines the UART 2 mode in your computer. The default value is ***Normal***. Other options include *IrDA* and *ASKIR*.

Parallel Port Mode

This field allows you to determine parallel port mode function.

SPP	Standard Printer Port
EPP	Enhanced Parallel Port
ECP	Extended Capabilities Port

PWRON After PWR-Fail

This field sets the system power status whether on or off when power returns from a power failure situation.

Midi Port Address

The option settings for this field are *330, 400* and *Disabled*.

Midi Port IRQ

The default Midi Port IRQ is ***10***.

Power Management Setup

The Power Management Setup allows you to save energy of your system effectively.

CMOS Setup Utility – Copyright ©1984-2001 Award Software
Power Management Setup

		ITEM HELP
Power Supply Type	ATX	Menu Level
ACPI Function	Enabled	
ACPI Suspend Type	SI (POS)	
Power Management	User Define	
Video Off Method	V/H Sync+Blank	
Video Off In Suspend	Yes	
Suspend Type	Stop Grant	
Modem Use IRQ	3	
Suspend Mode	Disabled	
HDD Power Down	Disabled	
Soft-Off by PWR-BTTN	Instant-Off	
CPU THRM-Throttling	50%	
Wake-Up by PCI Card	Disabled	
Power On by Ring	Disabled	
Resume by Alarm	Disabled	
Date (of Month) Alarm	0	
Time (hh:mm:ss) Alarm	0 : 0 : 0	
** Reload Global Timer Events **		
Primary IDE 0	Enabled	
Primary IDE 1	Enabled	
Secondary IDE 0	Enabled	
Secondary IDE 1	Enabled	
FDD, COM, LPT Port	Enabled	
PCI PIRQ[A-D] #	Enabled	

Power Supply Type

This field sets the power supply type that is in your system. By default, the setting is set to ***ATX***.

ACPI Function

Enable this function to support ACPI (Advance Configuration and Power Interface).

ACPI Suspend Type

This field sets the ACPI Power Management standby state. The default setting is ***S1 (POS)***.

Power Management

This field allows you to select the type of power saving management modes. There are four selections for Power Management.

Min. Power Saving	Minimum power management
Max. Power Saving	Maximum power management.
User Define	Each of the ranges is from 1 min. to 1hr. Except for HDD Power Down which ranges from 1 min. to 15 min.

Video Off Method

This field defines the Video Off features. There are three options.

V/H SYNC + Blank	Default setting, blank the screen and turn off vertical and horizontal scanning.
DPMS	Allows BIOS to control the video display.
Blank Screen	Writes blanks to the video buffer.

Video Off In Suspend

When enabled, the video is off in suspend mode. The default setting is ***Yes***.

Suspend Type

The default setting for the Suspend Type field is ***Stop Grant***.

Modem Use IRQ

This field sets the IRQ used by the Modem. By default, the setting is ***3***.

Suspend Mode

When enabled, and after the set time of system inactivity, all devices except the CPU will be shut off.

HDD Power Down

When enabled, and after the set time of system inactivity, the hard disk drive will be powered down while all other devices remain active.

Soft-Off by PWRBTN

This field defines the power-off mode when using an ATX power supply. The *Instant Off* mode allows powering off immediately upon pressing the power button. In the *Delay 4 Sec* mode, the system powers off when the power button is pressed for more than four seconds or enters the suspend mode when pressed for less than 4 seconds.

CPU THRM-Throttling
When the system enters Doze mode, the CPU clock runs only part of the time. You may select the percent of time that the clock runs.

Wake-Up by PCI Cards
Enable this field to allow wake up function through a PCI card.

Power On by Ring
This field enables or disables the power on of the system through the modem connected to the serial port or LAN.

Resume by Alarm
This field enables or disables the resumption of the system operation. When enabled, the user is allowed to set the *Date* and *Time*.

Reload Global Timer Events
The HDD, FDD, COM, LPT Ports, and PCI PIRQ are I/O events which can prevent the system from entering a power saving mode or can awaken the system from such a mode. When an I/O device wants to gain the attention of the operating system, it signals this by causing an IRQ to occur. When the operating system is ready to respond to the request, it interrupts itself and performs the service.

PNP/PCI Configurations

This option configures the PCI bus system. All PCI bus systems on the system use INT#, thus all installed PCI cards must be set to this value.

CMOS Setup Utility – Copyright ©1984-2001 Award Software
PnP/PCI Configurations

PNP OS Install	No	ITEM HELP
Reset Configuration Data	Disabled	Menu Level
Resources Controlled By	Auto (ESCD)	Default is Disabled. Select Enabled to reset Extended System Configuration Data (ESCD) when you exit Setup if you have installed a new add-on and the system reconfiguration has caused such a serious conflict that the OS cannot boot
IRQ Resources	Press Enter	
DMA Resources	Press Enter	
PCI/VGA Palette Snoop	Disabled	

PNP OS Install

Enable the PNP OS Install option if it is supported by the operating system installed. The default value is ***No***.

Reset Configuration Data

This field allows you to determine whether to reset the configuration data or not. The default value is ***Disabled.***

Resources Controlled by

This PnP BIOS can configure all of the boot and compatible devices automatically with the use of a use a PnP operating system such as Windows 95.

PCI/VGA Palette Snoop

Some non-standard VGA display cards may not show colors properly. This field allows you to set whether or not MPEG ISA/VESA VGA cards can work with PCI/VGA. When this field is enabled, a PCI/VGA can work with an MPEG ISA/VESA VGA card. When this field is disabled, a PCI/VGA cannot work with an MPEG ISA/VESA card.

PC Health Status

This section shows the parameters in determining the PC Health Status. These parameters include temperatures, fan speeds and voltages.

CMOS Setup Utility – Copyright ©1984-2001 Award Software
PC Health Status

		ITEM HELP
CPU Warning Temperature	Disabled	
Warning Beep	Disabled	
Current System Temp.	28°C/82°F	
Current System Temp.	35°C/95°F	
CPUFAN Speed	4166 RPM	
SystemFAN2 Speed	0 RPM	
SystemFAN3 Speed	0 RPM	
Vcore (V)	1.63V	
VCC3(V)	3.37V	
+5(V)	5.05V	
+12(V)	12.09V	
-12(V)	(-)12.03V	
VBAT	3.21V	
5VSB(V)	5.05V	
Shutdown Temperature	Disabled	

CPU Warning Temperature

This field allows the user to set the temperature so that when the temperature is reached, the systems sounds a warning. This function can help prevent damage to the system that is caused by overheating.

Temperatures/Fan Speeds/Voltages

These fields are the parameters of the hardware monitoring function feature of the CPU card. The values are read-only values as monitored by the system and show the PC health status.

Shutdown Temperature

This field allows the user to set the temperature by which the system automatically shuts down once the threshold temperature is reached. This function can help prevent damage to the system that is caused by overheating.

Frequency/Voltage Control

This section shows the user how to configure the processor frequency.

CMOS Setup Utility – Copyright ©1984-2001 Award Software
Frequency/Voltage Control

CPU Clock Ratio	12X	ITEM HELP
Auto Detect PCI Clk	Disabled	Menu Level
Spread Spectrum	Disabled	

CPU Clock Ratio

The CPU Ratio, also known as the CPU bus speed multiplier, can be configured through this field. The default setting is ***12X***. This parameter can be used in conjunction with the above field to change the processor's speed.

Auto Detect PCI Clk

This field enables or disables the auto detection of the PCI clock.

Spread Spectrum

This field sets the value of the spread spectrum. The default setting is ***Disabled***. This field is for CE testing use only.

Load Fail-Safe Defaults

This option allows you to load the troubleshooting default values permanently stored in the BIOS ROM. These default settings are non-optimal and disable all high-performance features.

Load Setup Defaults

This option allows you to load the default values to your system configuration. These default settings are optimal and enable all high performance features.

Set Supervisor/User Password

These two options set the system password. Supervisor Password sets a password that will be used to protect the system and Setup utility. User Password sets a password that will be used exclusively on the system. To specify a password, highlight the type you want and press <Enter>. The Enter Password: message prompts on the screen. Type the password, up to eight characters in length, and press <Enter>. The system confirms your password by asking you to type it again. After setting a password, the screen automatically returns to the main screen.

To disable a password, just press the <Enter> key when you are prompted to enter the password. A message will confirm the password to be disabled. Once the password is disabled, the system will boot and you can enter Setup freely.

Save & Exit Setup

This option allows you to determine whether or not to accept the modifications. If you type "Y", you will quit the setup utility and save all changes into the CMOS memory. If you type "N", you will return to Setup utility.

Exit Without Saving

Select this option to exit the Setup utility without saving the changes you have made in this session. Typing "Y" will quit the Setup utility without saving the modifications. Typing "N" will return you to Setup utility.

Drivers Installation

This section describes the installation procedures for software and drivers under the Windows 98, Windows NT 4.0 and Windows 2000. The software and drivers are included with the CPU card. If you find the items missing, please contact the vendor where you made the purchase. The contents of this section include the following:

Intel Chipset Software Installation Utility 54
Intel Application Accelerator..... 57
ATI M7 VGA Driver Installation..... 61
Intel 845G Chipset Graphics Driver..... 64
Sigmatel AC97 Codec Audio Driver..... 66
Intel PRO LAN Drivers Installation..... 68

IMPORTANT NOTE:
After installing your Windows operating system (Windows 98/98SE/ME/2000/XP), you must install first the Intel Chipset Software Installation Utility before proceeding with the drivers installation.

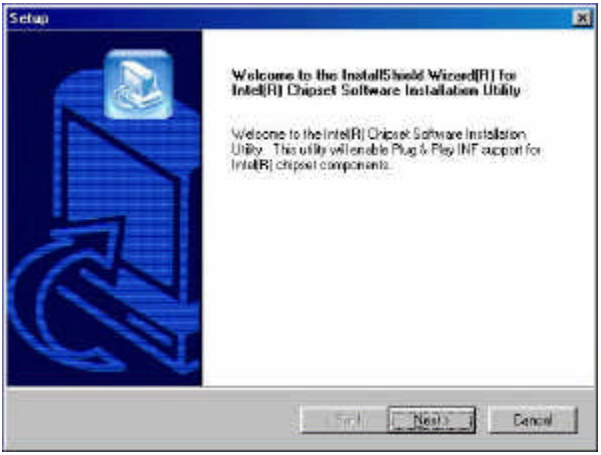
Intel Chipset Software Installation Utility

The Intel Chipset Software Installation Utility, to be installed first before the software drivers, will enable Plug & Play INF support for Intel chipset components. Follow the instructions below to complete the installation under Windows 98/98SE/ME/2000/XP.

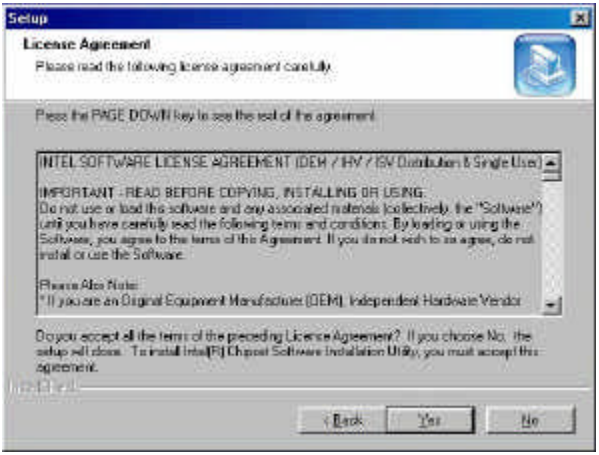
1. Insert the CD that comes with the CPU card and the screen below would appear. Click Intel Chipsets and then Intel 845G Chipset Drivers.

2. Click Intel Chipset Software Installation Utility.

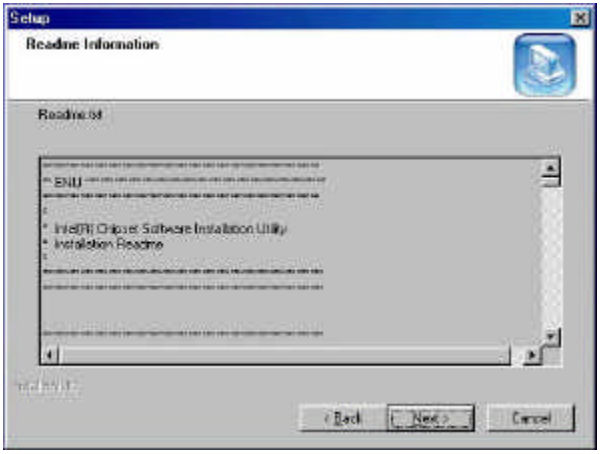
3. When the Welcome screen appears, click Next to continue.


Setup
Welcome to the InstallShield Wizard[R] for Intel[R] Chipset Software Installation Utility
Welcome to the Intel[R] Chipset Software Installation Utility. This utility will enable Plug & Play INF support for Intel[R] chipset components.
< Back
Next >
Cancel

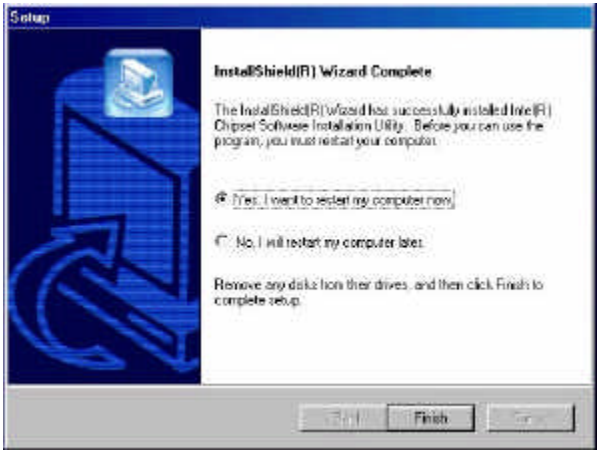
4. Click Yes to accept the software license agreement and proceed with the installation process.


Setup
License Agreement
Please read the following license agreement carefully.
Press the PAGE DOWN key to see the rest of the agreement.
INTEL SOFTWARE LICENSE AGREEMENT (OEM / IHV / ISV Distribution & Single User)
IMPORTANT - READ BEFORE COPYING, INSTALLING OR USING.
Do not use or load this software and any associated materials (collectively, the "Software") until you have carefully read the following terms and conditions. By loading or using the Software, you agree to the terms of this Agreement. If you do not wish to so agree, do not install or use the Software.
Please Also Note:
* If you are an Original Equipment Manufacturer (OEM), Independent Hardware Vendor
Do you accept all the terms of the preceding License Agreement? If you choose No, the setup will close. To install Intel[R] Chipset Software Installation Utility, you must accept this agreement.
< Back
Yes
No

5. On Readme Information screen, click Next to continue the installation.



6. The Setup process is now complete. Click Finish to restart the computer and for changes to take effect. When the computer has restarted, the system will be able to find some devices. Restart your computer when prompted.

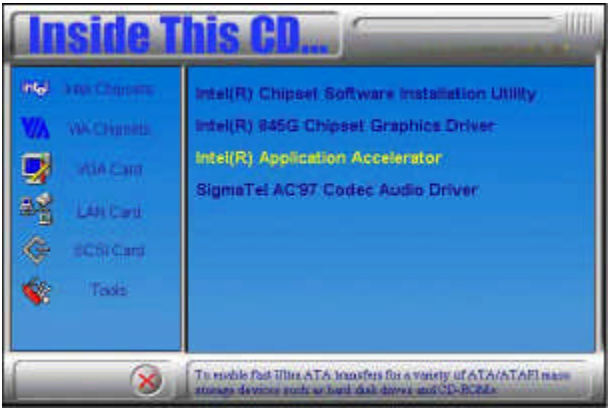

Setup
InstallShield(R) Wizard Complete
Yes, I want to restart my computer now.
No, I will restart my computer later.
Remove any disks from their drives, and then click Finish to complete setup.
Finish

Intel Application Accelerator

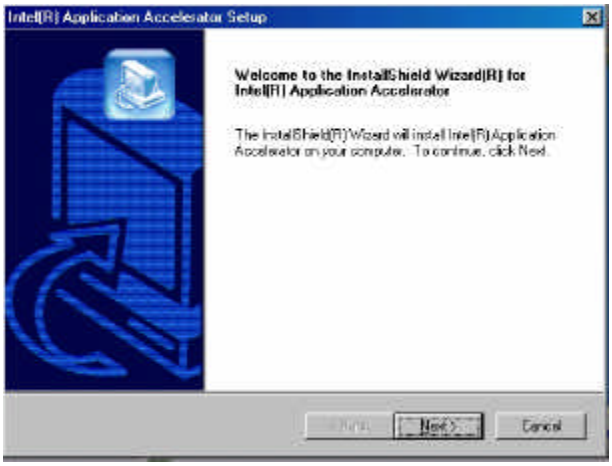
Follow the steps below to install Intel Application Accelerator with the InstallShield Wizard under Windows 98/98SE/ME/2000/XP/NT 4.0.

1. Insert the CD that comes with the CPU card and the screen below would appear. Click Intel Chipsets and then Intel 845G Chipset Drivers.

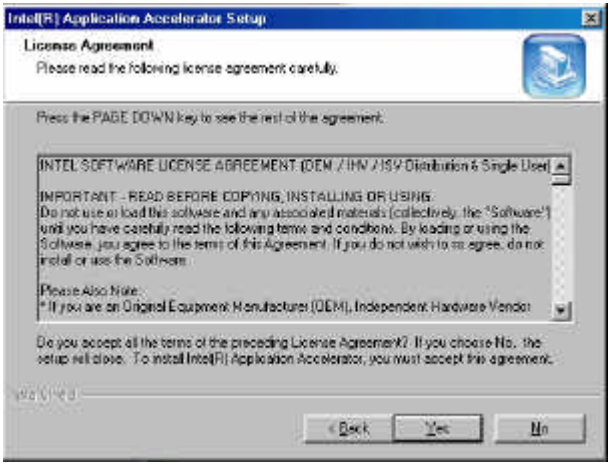
2. Click Intel Application Accelerator.



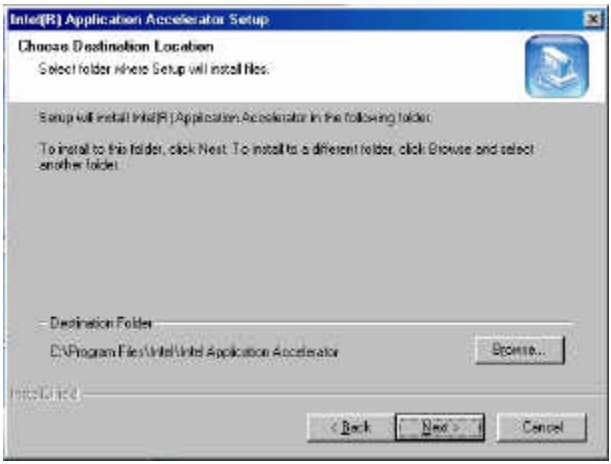
3. The Welcome screen of the Install Shield Wizard for Intel Application Accelerator.


Intel(R) Application Accelerator Setup
Welcome to the InstallShield Wizard(R) for Intel(R) Application Accelerator
The InstallShield(R) Wizard will install Intel(R) Application Accelerator on your computer. To continue, click Next.
< Back
Next >
Cancel

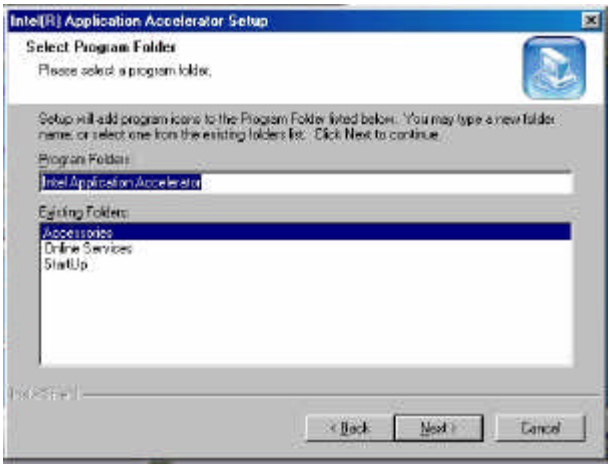
4. Click Yes to accept the software license agreement and proceed with the installation process.


Intel(R) Application Accelerator Setup
License Agreement
Please read the following license agreement carefully.
Press the PAGE DOWN key to see the rest of the agreement.
INTEL SOFTWARE LICENSE AGREEMENT (OEM / IHV / ISV Distribution & Single User)
IMPORTANT - READ BEFORE COPYING, INSTALLING OR USING.
Do not use or load this software and any associated materials (collectively, the "Software") until you have carefully read the following terms and conditions. By loading or using the Software, you agree to the terms of this Agreement. If you do not wish to so agree, do not install or use the Software.
Please Also Note:
* If you are an Original Equipment Manufacturer (OEM), Independent Hardware Vendor
Do you accept all the terms of the preceding License Agreement? If you choose No, the setup will close. To install Intel(R) Application Accelerator, you must accept this agreement.
InstallShield
< Back
Yes
No

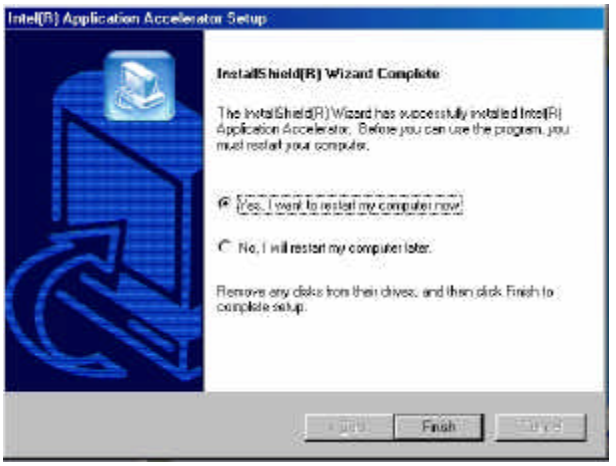
5. You are now required to select the folder where Setup will install files. Click Next to accept the default folder or click Browse to configure the location.


Intel(R) Application Accelerator Setup
Choose Destination Location
Select folder where Setup will install files.
Setup will install Intel(R) Application Accelerator in the following folder.
To install to this folder, click Next. To install to a different folder, click Browse and select another folder.
Destination Folder
C:\Program Files\Intel\Intel Application Accelerator
Browse...
InstallShield
< Back
Next >
Cancel

6. You are now asked to select a program folder. Click Next to accept the default program folder or enter the folder name you prefer.

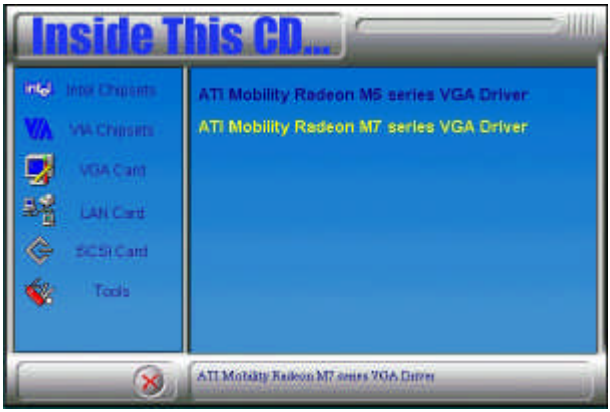

Intel(R) Application Accelerator Setup
Select Program Folder
Please select a program folder.
Setup will add program icons to the Program Folder listed below. You may type a new folder name, or select one from the existing folders list. Click Next to continue.
Program Folders:
Intel Application Accelerator
Existing Folders:
Accessories
Online Services
StartUp
< Back
Next >
Cancel

7. The InstallShield Wizard has completed installation. Click Finish for the computer to restart and changes to take effect.

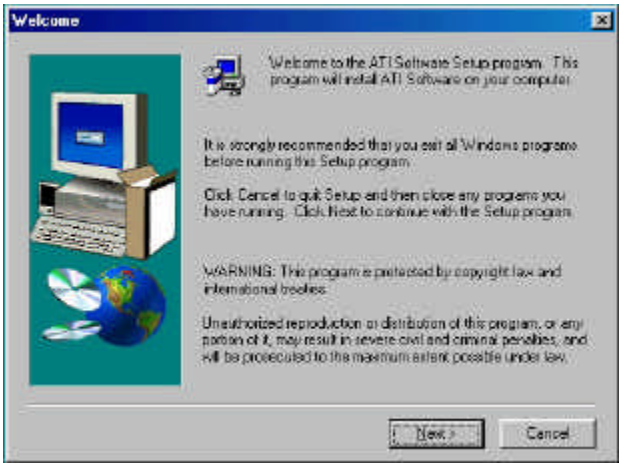

Intel(R) Application Accelerator Setup
InstallShield(R) Wizard Complete
The InstallShield(R) Wizard has successfully installed Intel(R) Application Accelerator. Before you can use the program, you must restart your computer.
Yes, I want to restart my computer now.
No, I will restart my computer later.
Remove any disks from their drives, and then click Finish to complete setup.
Finish

ATI M7 VGA Driver Installation

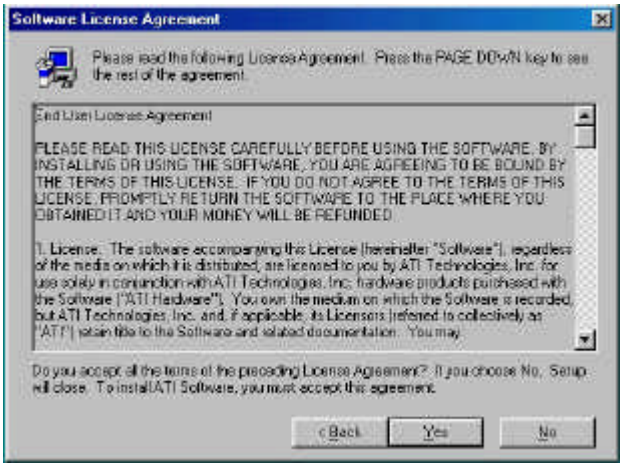
1. Insert the CD that comes with the CPU card. On the initial screen, click VGA Card on the left side and the screen below would appear. Click ATI Mobility Radeon M7 series VGA Driver.



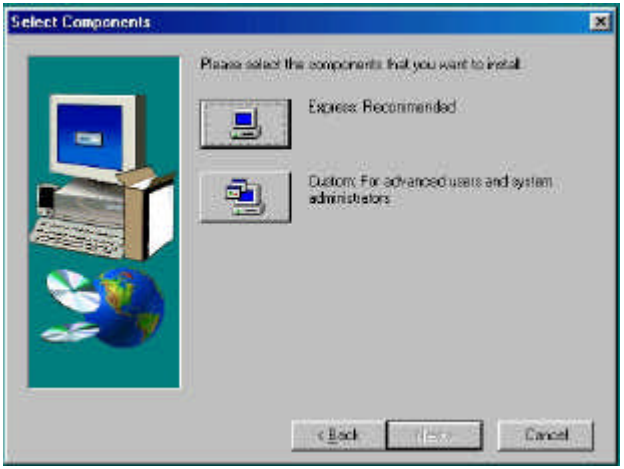
2. When the Welcome screen appears, click Next to continue.


Welcome
Welcome to the ATI Software Setup program. This program will install ATI Software on your computer.
It is strongly recommended that you exit all Windows programs before running this Setup program.
Click Cancel to quit Setup and then close any programs you have running. Click Next to continue with the Setup program.
WARNING: This program is protected by copyright law and international treaties.
Unauthorized reproduction or distribution of this program, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under law.
Next >
Cancel

3. Click Yes to accept the software license agreement and proceed with the installation process.


Software License Agreement
Please read the following License Agreement. Press the PAGE DOWN key to see the rest of the agreement.
End User License Agreement
PLEASE READ THIS LICENSE CAREFULLY BEFORE USING THE SOFTWARE. BY INSTALLING OR USING THE SOFTWARE, YOU ARE AGREEING TO BE BOUND BY THE TERMS OF THIS LICENSE. IF YOU DO NOT AGREE TO THE TERMS OF THIS LICENSE, PROMPTLY RETURN THE SOFTWARE TO THE PLACE WHERE YOU OBTAINED IT AND YOUR MONEY WILL BE REFUNDED.
1. License. The software accompanying this License (hereinafter "Software"), regardless of the media on which it is distributed, are licensed to you by ATI Technologies, Inc. for use solely in conjunction with ATI Technologies, Inc. hardware products purchased with the Software ("ATI Hardware"). You own the medium on which the Software is recorded, but ATI Technologies, Inc. and, if applicable, its Licensors (referred to collectively as "ATI") retain title to the Software and related documentation. You may
Do you accept all the terms of the preceding License Agreement? If you choose No, Setup will close. To install ATI Software, you must accept this agreement.
< Back
Yes
No

4. Select on the Express icon and click Next to continue.


Select Components
Please select the components that you want to install.
Express: Recommended
Custom: For advanced users and system administrators
< Back
Next >
Cancel

5. The Setup process is now complete. Click Finish to restart the computer and for changes to take effect. Restart your computer when prompted.

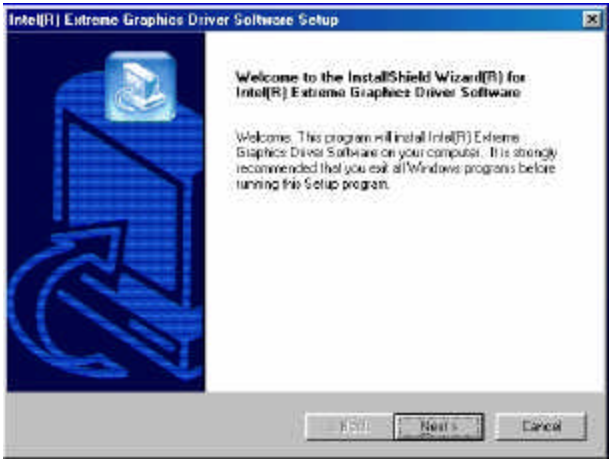
Setup Complete
Setup has finished copying files to your computer.
Before you can use the program, you must restart Windows or your computer.
Yes, I want to restart my computer now.
No, I will restart my computer later.
Finish

Intel 845G Chipset Graphics Driver Installation

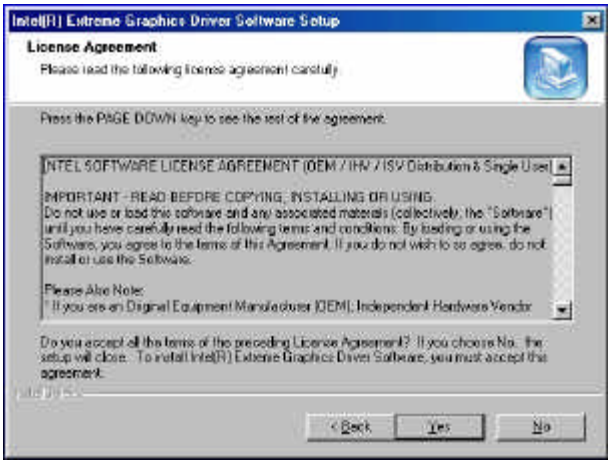
Follow the steps below to install the Intel 845G graphics driver under Windows 98/98SE/ME/2000/XP/NT 4.0.

1. Insert the CD that comes with the CPU card. Click Intel Chipsets on the left side of the screen. Then select, Intel 845G Chipset Drivers, then Intel 845G Chipset Graphics Driver.

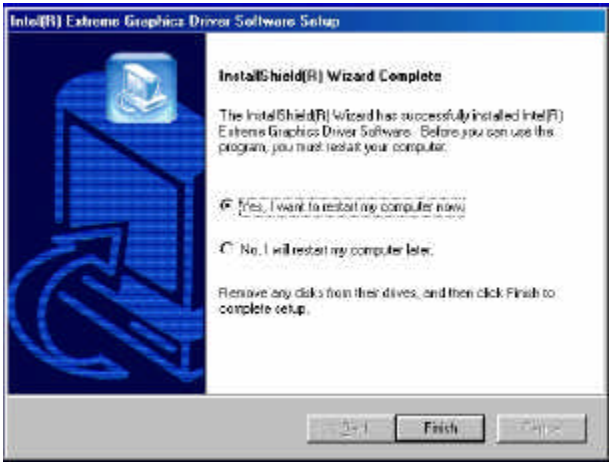
2. When the Welcome screen appears, click Next to continue.


Intel(R) Extreme Graphics Driver Software Setup
Welcome to the InstallShield Wizard(R) for Intel(R) Extreme Graphics Driver Software
Welcome. This program will install Intel(R) Extreme Graphics Driver Software on your computer. It is strongly recommended that you exit all Windows programs before running this Setup program.
< Back
Next >
Cancel

3. Click Yes to accept the software license agreement and proceed with the installation process.


Intel(R) Extreme Graphics Driver Software Setup
License Agreement
Please read the following license agreement carefully
Press the PAGE DOWN key to see the rest of the agreement.
INTEL SOFTWARE LICENSE AGREEMENT (OEM / IHV / ISV Distribution & Single User)
IMPORTANT - READ BEFORE COPYING, INSTALLING OR USING.
Do not use or load this software and any associated materials (collectively, the "Software") until you have carefully read the following terms and conditions. By loading or using the Software, you agree to the terms of this Agreement. If you do not wish to so agree, do not install or use the Software.
Please Also Note:
* If you are an Original Equipment Manufacturer (OEM), Independent Hardware Vendor
Do you accept all the terms of the preceding License Agreement? If you choose No, the setup will close. To install Intel(R) Extreme Graphics Driver Software, you must accept this agreement.
< Back
Yes
No

4. The Setup process is now complete. Click Finish to restart the computer and for changes to take effect. Restart your computer when prompted.


Intel(R) Extreme Graphics Driver Software Setup
InstallShield(R) Wizard Complete
The InstallShield(R) Wizard has successfully installed Intel(R) Extreme Graphics Driver Software. Before you can use the program, you must restart your computer.
Yes, I want to restart my computer now.
No, I will restart my computer later.
Remove any disks from their drives, and then click Finish to complete setup.
Finish

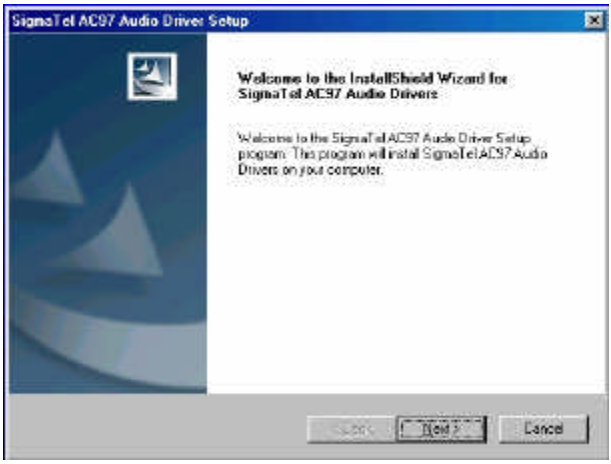
Sigmatel AC97 Codec Audio Driver Installation

Follow the steps below to install SigmaTel AC97 Audio Drivers on your system.

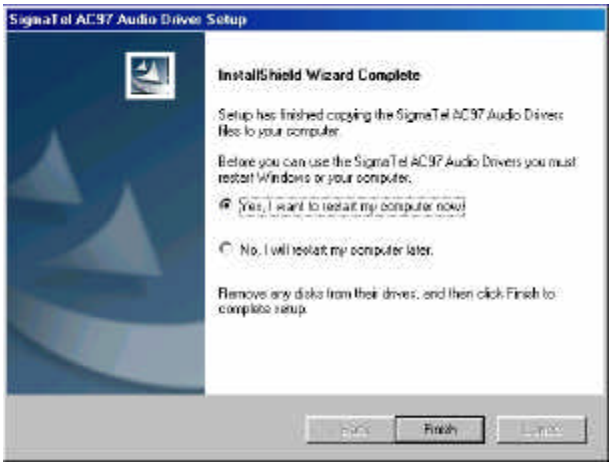
1. Insert the CD that comes with the CPU card and the screen below would appear. Click Intel Chipsets, then Intel 845G Chipset Drivers.

2. Click SigmaTel AC97 Audio Driver.

3. The Welcome screen of the SigmaTel AC97 Audio Driver Setup program appears. To continue and start the installation, click Next.


SigmaTel AC97 Audio Driver Setup
Welcome to the InstallShield Wizard for SigmaTel AC97 Audio Drivers
Welcome to the SigmaTel AC97 Audio Driver Setup program. This program will install SigmaTel AC97 Audio Drivers on your computer.
Cancel

4. Finish to restart the computer and for changes to take effect. .

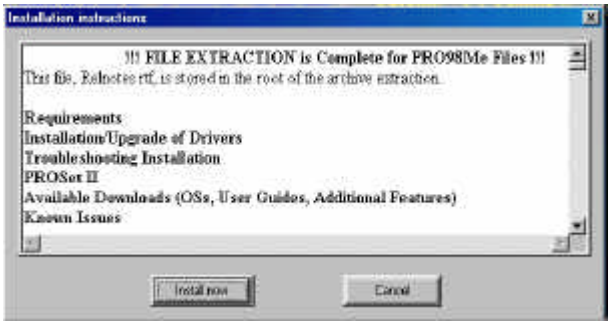

SigmaTel AC97 Audio Driver Setup
InstallShield Wizard Complete
Setup has finished copying the SigmaTel AC97 Audio Drivers files to your computer.
Before you can use the SigmaTel AC97 Audio Drivers you must restart Windows or your computer.
Yes, I want to restart my computer now.
No, I will restart my computer later.
Remove any disks from their drives, and then click Finish to complete setup.
Finish

Intel PRO LAN Drivers Installation

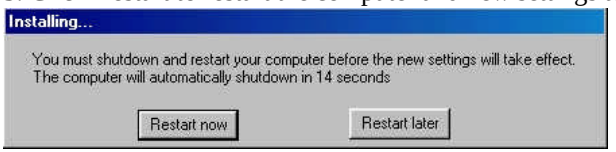
The Intel PRO LAN drivers support both Intel® PRO/100 and PRO/1000 drivers. Follow the steps below to complete the installation.

1. Insert the CD that comes with the CPU card and the screen below would appear. Click on LAN Card on the left side to make the LAN drivers selection. Click on Intel(R) PRO LAN Drivers.

2. Click Install Now.



3. Click Restart to restart the computer and new settings to take effect.


Installing...
You must shutdown and restart your computer before the new settings will take effect.
The computer will automatically shutdown in 14 seconds
Restart now
Restart later

Appendix

A. I/O Port Address Map

Each peripheral device in the system is assigned a set of I/O port addresses which also becomes the identity of the device. The following table lists the I/O port addresses used.

Address	Device Description
000h - 01Fh	DMA Controller #1
020h - 03Fh	Interrupt Controller #1
040h - 05Fh	Timer
060h - 06Fh	Keyboard Controller
070h - 07Fh	Real Time Clock, NMI
080h - 09Fh	DMA Page Register
0A0h - 0BFh	Interrupt Controller #2
0C0h - 0DFh	DMA Controller #2
0F0h	Clear Math Coprocessor Busy Signal
0F1h	Reset Math Coprocessor
1F0h - 1F7h	IDE Interface
278 - 27F	Parallel Port #2(LPT2)
2F8h - 2FFh	Serial Port #2(COM2)
2B0 - 2DF	Graphics adapter Controller
378h - 3FFh	Parallel Port #1(LPT1)
360 - 36F	Network Ports
3B0 - 3BF	Monochrome & Printer adapter
3C0 - 3CF	EGA adapter
3D0 - 3DF	CGA adapter
3F0h - 3F7h	Floppy Disk Controller
3F8h - 3FFh	Serial Port #1(COM1)

B. Interrupt Request Lines (IRQ)

Peripheral devices use interrupt request lines to notify CPU for the service required. The following table shows the IRQ used by the devices on board.

Level	Function
IRQ0	System Timer Output
IRQ1	Keyboard
IRQ2	Interrupt Cascade
IRQ3	Serial Port #2
IRQ4	Serial Port #1
IRQ5	Reserved
IRQ6	Floppy Disk Controller
IRQ7	Parallel Port #1
IRQ8	Real Time Clock
IRQ9	Reserved
IRQ10	Reserved
IRQ11	Reserved
IRQ12	PS/2 Mouse
IRQ13	80287
IRQ14	Primary IDE
IRQ15	Secondary IDE